TANGAROA BLUE OCEAN CARE SOCIETY

2009 South West Marine Debris Project (South West Australia)

Technical Report

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Thank you to the following government agencies and organisations for funding and support, enabling us to continue the South West Marine Debris Project.

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1. EXECUTIVE SUMMARY

Five Years Tackling Marine Debris

2009 represents a milestone for the South West Marine Debris Project. Five years of annual beach cleanups and three years of monthly monitoring at selected sites has provided the framework for establishing and implementing marine debris education programmes, prevention activities, an educational website www.oceancare.org.au and a database for beach cleanup data. 2009 also marks a change in funding source availability and criteria. To accommodate these changes and expand its funding options Tangaroa Blue Ocean Care Society has changed its organisational status and is now a public company (limited by guarantee – charity) and is awaiting inclusion on the register of environmental organisations.

Over the course of the South West Marine Debris Project to date, the thousands of hours of cleanup activities carried out by volunteers, school students and teachers, members and partner organisations, together with their feedback of information has produced a strong flow of cleanup data and enabled us to develop some methods for interpreting that data. The result is a better understanding of the wheres, whys and sources of marine debris on south west beaches. We can now give a reliable estimate as to the proportion of locally generated debris and show what types of debris are prevalent at various locations. The efforts of participants have also enabled us to demonstrate the ubiquitous presence of fragmented plastic debris and resin pellets in some of our most highly valued coastal environs. Data from annual cleanups and monthly monitoring has also enabled us to better understand the seasonal patterns of marine debris.

The "operational template" evolved out of the South West Marine Debris Project has been successfully implemented in Queensland in the Far North Queensland Marine Debris Project and we are currently proposing at a national level to build on existing projects and develop new projects in all states in the near future.

It is essential to protect our oceans. In global terms the harm, suffering and systemic damage caused by marine pollution generally, and marine debris in particular have reached critical levels. The oceans can only provide oxygen, fresh water and nutrients to all land based life forms while the ocean and its interconnected living systems remain in a healthy state. Our pollution and our over use and misuse of ocean resources is now clearly compromising this healthy oceanic state. We exist in a highly interconnected living world – there is no separation, no immunity from the longer term consequences flowing from the compromised health of the oceans for any species including our own.

Cleaning a beach is a simple, healthy and effective way for individuals and groups to actively participate in the tackling of this problem and by collecting data from their cleanups communities can proactively identify local threats and find practical solutions. We are looking forward to encouraging and helping more communities around the country to become involved in these activities.

To every person and every organisation contributing to the South West Marine Debris Project in the last five years we extend our sincere thanks and look forward to continuing the project with you well into the future.

Project Expansion

Coverage of the WA coastline continued to expand during 2009. Participants and groups are now conducting cleanups in areas including Perth, Jurien Bay, Geraldton and Broome and along the south coast at a growing number of sites in the D'Entreacasteux National Park and in Denmark. Data from these new sites will be covered in the 2010 Western Australia Technical Report.

Outcomes

Following our first Cape to Cape cleanup in 2005 we identified plastic strapping bands (also known as bait bands) as a priority item to remove from the coastal environment. In the five years since we have provided data on plastic strapping bands, provided information and reports and carried out lobbying activities to stop the use of plastic bands and encourage alternative existing methods of securing bait packaging. Efforts by Tangaroa Blue Ocean Care Society, the West Australian Fishing Industry Council, the Department of Fisheries and the Rock Lobster Industry Advisory Committee have led to a positive decision on the use of plastic strapping bands. In late 2009 the WA Minister for Fisheries approved a prohibition on plastic bait bands in the Lobster fishery, prohibiting the bands on all active rock lobster boats from the start of the 2010/11 season. The minister also sought further advice on extending the prohibition as an industry wide prohibition of bait bands at sea.

2009 also saw the continuation of our educational program with schools throughout the south west and Broome being introduced to the issue of marine debris through presentations, workshops and beach clean ups. Schools who have registered with the program and adopted a local stretch of coastline continue to submit data, photos and reports providing not only valuable information on their local coastal environment, but also instilling in students the importance of protecting their environment and the value of volunteering in their community.

Our main cleanup outcomes are covered in the following technical report on the 2009 South West Beach Cleanup Report together with a summary of the data from several regular monitoring projects. The technical report provides a detailed summary of our current understanding of the marine debris issue and potential impacts on the south west coast of Western Australia based on all our findings to date.

Looking Ahead

In our view south west beaches in the state of Western Australia are deteriorating both from the marine debris and the marine pollution standpoint. A greater research effort needs to occur into marine debris and its impacts. Revues of policy and action related to marine debris prevention and mitigation measures are needed from government if we are to head off a worsening situation driven by rapid population growth. Mitigation of marine debris starts with litter prevention but must extend into areas including industry and coastal facility housekeeping, stormwater management and handling, storage and transport methods. Finding alternatives to plastic packaging is also essential and government and local government regulation is urged as one measure toward this. Consumers whether private, corporate or government, can also send a strong message aimed at reducing unnecessary plastic packaging.

2. TECHNICAL SUMMARY

The South West Beach Cleanup 2009 was conducted during October with an expanded cleanup catchment. Although the number of individual cleanups remained consistent and the total length of sites was down by 6%, the number of items collected increased by 13% from 2008, with the average density of items on the beaches increasing by 23% indicating a continuing general increase in the amount of debris and litter on south west beaches. Based on a new index which gives a guide to the proportion of debris resulting from litter and local sources compared to offshore, longshore and runoff sources, our data indicates that on average 34% of rubbish found on south west beaches during the October cleanup was due to littering. The highest litter and local index figure came from the underwater cleanup of Busselton Jetty with 98% locally sourced items (fishing line). Bridport Point at Port Kennedy had the highest beach site value with 75% litter, while Deepdene Beach showed the lowest litter and local levels with a 1% proportion of litter. Packaging items are a primary concern with data showing rapid growth in this category.

66% of items from the October cleanup came from various offshore sources. This part of our data indicates a growing background presence of debris affecting our oceans, coasts and marine life. Of concern this year was the arrival of large offshore items which were blown ashore in the mid to late winter period. These items, including a very large buoy and a tuna line estimated to be several kilometres long, pose a serious threat to marine life and present volunteers and government agencies with difficult and sometimes dangerous removal logistics. There is a strong probability that more large items and long lengths and bundles of rope are now within range of the coast and could be blown ashore in the 2010 winter.

Items of major concern for their potential to harm marine life and which fall into the top 20 items list for this cleanup are pieces of plastic – especially those smaller than 10mm, rope, cigarette butts, plastic film such as food wrap, wrappers and plastic bags. Although too small to record in the standard cleanup data plastic resin pellets – one of the most prevalent items on our coast - are also a serious threat to marine life.

Two marine pollution events with serious ramifications arose during 2009. The first is the rising pollution levels in the Swan River. Related to this is the disturbance of pollutants in the sediments at Fremantle Harbour due to dredging.

Dredging at Fremantle Harbour will generate a short burst of pollutants into the adjacent coastal system. Rising toxic levels in the Swan River are part of an ongoing long term and increasing injection of pollutants into the local ocean system. The death of a number of Swan River Dolphins (at the top of the food chain) tells us that these toxins are impacting the food web at all levels and that the impacts will continue to affect successive generations of life in the river.

From a marine debris perspective a further process that needs to be included in the debate around these issues is that the increasing long term levels and episodic releases of these pollutants – especially endocrine active substances such as organochlorine pesticides and their breakdown products – results in a higher concentration in the sea surface micro layer over the affected area. (The Sea Surface Micro Layer or SSL is the top 1mm of sea surface). Any plastic debris but especially small plastic pieces and resin pellets which drift in the SSL will absorb these toxins and in time they will be more widely distributed down the west coast and into adjacent seas.

The second issue relates to the West Atlas oil spill in the Timor Sea. Tar balls can often be found on south west beaches during winter and some of these are known to originate from natural processes in the Indonesian region, having been transported south in the Leeuwin Current. With this in mind there is a reasonable possibility that some of the spilt oil – most likely in the form of sticky oil globules – will affect the south west coast. We are keen to hear from anyone who observes unusual oil occurrences in their location and also from anyone who would like to regularly monitor for oil during winter and spring in their location along the coast. Oil contains endocrine active substances in the form of PAHs (polycyclic aromatic hydrocarbons). The dispersant used to break up the oil also contains endocrine active substances and the combined effect of the releases from the oil spill will have impacts on sea life far beyond the Timor Sea.

There is much evidence in this years' cleanup data of potentially harmful and life threatening marine debris. Our coast is seriously polluted. We remain concerned that very little local research is occurring into the actual impacts of marine debris and pollution on the many levels of our marine and coastal systems. We know of the entanglement impacts on the larger fish and sea mammals but have no knowledge of impacts at the microscopic levels of life in the sea, in the reefs, among the rocks and on the beaches from the constant flow of toxic chemicals, micro plastic pollutants and the newly generated threats from nano materials and particles contained in cosmetic and personal care items.

3. SOUTH WEST BEACH CLEANUP 2009

CLEANUP STATISTICS - SOUTH WEST BEACH CLEANUP 2009

Table 1 - South West Beach Cleanup 2009 - Project Cleanup Summary

Statistic	Cape to Cape Beach Cleanup 2007		Cape to Cape Beach Cleanup 2008		South West Beach Cleanup 2009	
	Totals	% Change Previous Year	Totals	% Change Previous Year	Totals	% Change Previous Year
Number of Cleanups	47	n/a	72	13%	74	1%
Total Items Collected	19074	n/a	26362.65	9%	36702.78	13%
Number of Bags Filled	244.5	n/a	356.75	12%	372	2%
Total Weight Kilograms	1190	n/a	1876.45	12%	2480.75	11%
Density - Number of Items per Metre of Beach	0.25	n/a	0.25	0%	0.47	23%
Combined Length of Sites Cleaned Kilometres	100.7	n/a	157.2	14%	133.5.	-6%

Table 2 below, summarises the basic cleanup details for each site. Sites are grouped into coastal stretches starting with the south coast and progressing through to the mid west coast. Details of the site locations are contained in Attachment 1. The table also includes a new index figure – this has been developed as a guide for indicating how much direct local litter and dumping is occurring compared to debris coming from runoff, longshore and offshore sources. Details of this index are explained on page 17.

Table 2 – Site Cleanup Details

Site	Total	Site Length Metres	Density	Bags	Weight Kg	Litter & Local Source Index	Non Local Source Index
South Coast							
Nornalup Blue Holes Beach	922	8000	0.12	20	66.2	0.06	0.94
Yeagarup D'Entreacasteux NP	1300	12200	0.11	75	800	0.38	0.62
Augusta River mouth to Lookout	289.2	2600	0.11	2	4	0.68	0.32
Augusta Lookout to Lighthouse	146.6	1330	0.11	1	4.5	0.25	0.75
South Coast Totals/Averages	**2657.8**	**24130**	**0.11**	**98**	**874.7**	**0.41**	**0.59**

Capes Coast							
Quarry Bay	270.4	380	0.71	1	3	0.09	0.91
Skippy Rock Beach	115	800	0.14	3	15	0.06	0.94
Hillview	418.1	1800	0.23	5	23	0.16	0.84
Deepdene	4195.1	4500	0.93	14	115.5	0.01	0.99
Deepdene to Cosy Corner	64	3000	0.02	3	6	0.24	0.76
Cosy Corner	356	710	0.50	2	8	0.05	0.95
Foul Bay	550.1	1000	0.55	4	24.5	0.07	0.93
Hamelin Bay South End	796	2000	0.40	3	40	0.18	0.82
Boranup Beach	2622.7	4000	0.66	19	209	0.04	0.96
South Beach	1111	1500	0.74	5	26.5	0.03	0.97
Conto Spring	134	1000	0.13	4	35	0.03	0.97
Redgate Beach	207	1000	0.21	2	12	0.21	0.79
Boodjidup Beach	142.2	1500	0.09	1	5.5	0.11	0.89
Boodjidup to Gas Bay	465	3000	0.16	6	36	0.57	0.43
Prevelly-Gnarabup to Surf Point	472	2500	0.19	3	22	0.41	0.59
Kilcarnup	354	2000	0.18	12	72	0.29	0.71
Joey's Nose	290	3000	0.10	4	10	0.14	0.86
Ellensbrook Lookout to Creek	258	600	0.43	1	3.5	0.08	0.92
Gracetown South Point to Lefties	699	3000	0.23	5	48.75	0.32	0.68
Ellensbrook to Womb	608	1000	0.61	2	8	0.07	0.93
Gracetown Bay	51	500	0.10	0.5	2	0.37	0.63
Gracetown North Point and Jetty Beach	185	1000	0.19	0.5	2	0.58	0.42
Guillotine	161.9	630	0.26	2	25	0.07	0.93
Gallows	777.3	900	0.86		35	0.02	0.98
Willyabrup	72.5	1000	0.07	3	5	0.10	0.90
Moses Rock	403.8	1000	0.40	3	18	0.05	0.95
Quinninup Beach	776.5	4000	0.19	3	20	0.02	0.98
3 Bears	2162	1000	2.16	5	26	0.11	0.89
Injidup - Mitchell Rocks to Car park	99	500	0.20	0.5	3	0.06	0.94
Mitchell Rocks to Wyadup	452.68	1000	0.45	0.5	3.8	0.07	0.93
Smiths Beach	182	2000	0.09	2	10	0.27	0.73
Yallingup	580	2000	0.29	2	5	0.17	0.83
Sugarloaf Rock	649	600	1.08	7	30	0.10	0.90
Windmills	1160	3000	0.39	8	18	0.22	0.78
Capes Coast Totals/Averages	**21840.28**	**57420**	**0.37**	**136**	**926.05**	**0.21**	**0.79**
Geographe Bay							
Bunker Bay	96	2000	0.05	2	10	0.60	0.40
Eagle Bay Dog Beach	111.3	1500	0.07	2	12	0.59	0.41
Point Picquet	668	1500	0.45	5	37	0.67	0.33
Meelup	439	5000	0.09	8	20	0.61	0.39
Castle Bay and Rock	469	2000	0.23	5	15	0.68	0.32
Old Dunsborough	495	2000	0.25	2	12	0.65	0.35
Dunsborough Town Beach	389	3000	0.13	2	56.5	0.66	0.34
Quindalup Boat Ramp	51	2500	0.02	1	5	0.36	0.64

Busselton Dolphin Road Boat Ramp	24	1000	0.02	1	2	0.66	0.34
Busselton Jetty Foreshore	824.5	1500	0.55	3	15.5	0.71	0.29
Busselton Jetty Underwater Cleanup	2301	300	7.67	2	44	0.98	0.02
Capel Peppermint Grove Beach	441.5	6000	0.07	8	65	0.50	0.50
Capel Dalyellup Beach	280	2000	0.14	4	12	0.58	0.43
Bunbury Back and BP Beach	1319	2500	0.53	11	30	0.62	0.38
Bunbury Back Beach	106	1000	0.11	2	4	0.55	0.45
Bunbury Blair St to Hayes St Drain	120	200	0.60	1	10	0.63	0.37
Bunbury Koombana Bay Turkey Point	294	1500	0.20	2	6	0.57	0.43
Geographe Bay Totals/Averages	**8428.3**	**35500**	**0.66**	**61**	**356**	**0.64**	**0.36**
West Coast							
Binningup	291.9	400	0.73	1	8	0.26	0.74
Dawesville Channel to Silver Sands	329	6000	0.05	20	80	0.57	0.43
Mandurah Silver Sands	603	2000	0.30	10	55	0.73	0.27
Port Kennedy Bridport Point	202	2000	0.10	2	6	0.75	0.25
Woodman Point	536.5	4000	0.13	22	100	0.70	0.30
Cottesloe	251	1000	0.25	1	15	0.26	0.74
Marmion Marine Park	1472	900	1.64	20	50	0.42	0.58
West Coast Totals/Averages	**3685.4**	**16300**	**0.46**	**76**	**314**	**0.54**	**0.46**
Mid West Coast							
Ledge Point	**91**	**150**	**0.61**	**1**	**10**	**0.18**	**0.82**
Total Number of Sites = 63							
Project Totals/Averages	**36702.78**	**133500.0**	**0.47**	**372.00**	**2480.75**	**0.34**	**0.66**

This year's cleanup was extended to the Walpole Denmark area with large amounts of debris coming from these cleanups.

Above left - volunteers at Yeagarup Dunes near Pemberton. Above right - volunteers counting debris from Blue Holes Beach Nornalup

DETAILS OF ITEMS COLLECTED – SOUTH WEST BEACH CLEANUP 2009

The following tables show the total items collected during the project. There is one table per category with items grouped into subcategories and ranked according to total. Plastic resin pellets are not included in the table. These very small items were very much in evidence at some sites such as Deepdene.

Table 3 - End User Items

End User Items			
Food and Drink		Surfboard Parts	1
Straws	362	Tent Pegs	1
Cups/Plates/Cutlery	199	Golf Tee	1
Confection Sticks	164	Fishing Tackle Box	1
Tea Bag	15	Stickers	1
CO2 Gas Capsule	2	**Smoking**	
Chewing Gum	2	Cigarettes/Filters	1312
Clothing and Accessories		Cigarette Lighters	92
Cloth/Clothing	314	Cigar Tips	14
Shoes	214	Drug Paraphernalia	13
Thong (Flip Flop) Rubber Off Cuts	17	Matches	5
Hair Ties	13	**Medical, Personal and Hygiene**	
Cap Visor Plastic	11	Tissues	176
Sunglasses/Glasses	8	Cotton Bud Stems	85
Clothes Hanger Plastic	3	Toothbrushes	46
Caps/Hats	3	Condoms/Wrappers	22
Hats/Caps	1	Brushes/Combs	13
Recreation		Band Aid	13
Fishing Floats	142	Nappies	12
Toys	99	Tampons/Applicators/Sanitary Napkins	8
Plastic Bags Dog Poo	85	Syringes	7
Hooks/Sinkers	59	Asthma Inhalers	4
Balloons	45	Dummy	2
Party Streamers	40	Baby Resuscitator	1
Fishing Lures	38	Bandage Roll	1
Recreation Equipment Whole and Part	24	Bath Sponge	1
Surf Wax	9	Soap	1
Fishing Rod/Hand Reel	6	**Miscellaneous**	
Torch	3	Binding/Thread/String	164
Bait Mate Spool	3	Pens/Pencils	39
Balloon Ribbons	3	Candle	6
Stubby Holder	2	Glue Sticks	3
Plastic Bucket <20L	1	Plastic Measuring Scoops	2
Fireworks	1	***Total End User***	***3935***

Table 4 - Packaging Items

Packaging items			
Drink Packaging		Pharmaceutical Containers	44
Plastic Drink Bottles	1133	Plastic Bag Clips	16
Glass Drink Bottles	1121	Oil/Lube Bottles	8
Aluminium Cans	920	Lighter Fluid Canister	1
Pull Tabs	11	Liquid Metal Filler Tube	1
Food Packaging		**Ind., Comm., Farming and Fishing Packaging**	
Plastic Wrap - Food	983	Bleach/Cleaner Bottles	100
Plastic Bags	870	Aerosol Cans	45
Paper/Newspaper/Cardboard	703	Plastic Sheeting/Tarps	32
Plastic Containers	423	Poly-weave Bag	30
Foil	162	Hessian Bag	20
Glass Jars	60	20 Litre Drums	10
Tins	35	55-Gal. Drums	3
Onion Bags	1	Steel Bucket 20l	2
Other End User Packaging		150l Plastic Drum	1
Plastic Wrap - Non Food	646	Paint Tin	1
Bait Bags/Packaging	216	30 Litre Drums	1
Skincare Bottles/Tubes	94	***Total Packaging***	***7753***
Tobacco Packaging	60		

Table 5 - Industrial, Commercial, Fishing and Farming Items

Industrial, Commercial, Fishing and Farming Items			
Pot and Trap Fishing		Pallets	12
Bait Containers/Lids	154	Brooms	5
Buoys/Floats	73	Fluorescent Tube Starters	4
Crates/Buckets	44	Tags	4
Crab/Lobster/Fish Traps	25	Sellotape Roll	2
Net and Line Fishing		**Farming**	
Cylume Chemical Glow Sticks	321	Shotgun Shells	12
Drift Net Floats	58	Barbed Wire	1
Shipping		Cow Inserts	1
Light Bulbs/Tubes	49	***Total Ind., Comm., Fishing and Farm***	***786***
Cable Ties/Tags	21		

Table 6 - Linear Items

Linear Items			
Linear Items		Strapping Bands - Metres	407.58
Fishing Line - metres	2589	Fishing Net - Metres	27
Rope - metres	1524.2	***Total Linear***	***4547.78***

Table 7 - Sundry Items

Sundry Items			
Materials		Sealant Tubes	8
Wood	297	Plastic Mesh	1
Rubber	146	**Occ., Health and Safety Equipment**	
Metal	47	Ear Plug	12
Carpet	24	Gloves Rubber	4
Wax	5	Helmet Insert	1
Plastic Foam Sheeting	3	Life Jacket	1
Shade Cloth	2	**Household, Furniture and Whitegoods**	
Electricals		Building Materials	31
Electrical Cable and Equipment	8	Plastic Mesh/Netting	3
E-Waste		Household Plastic Ornaments	2
Batteries	11	Chairs Folding	2
E-Waste	4	White Goods	1
Mobile Phone	1	Toilet Seat	1
Printer Cartridge	1	Plastic Hook Shower Curtain	1
Boat and Vehicle Parts		Plastic Chair pieces	1
Boat Pieces	45	Mattress	1
Cars/Car Parts	27	Gate	1
Tyres	23	Furniture Cover	1
Marine Engine Parts	9	Furniture	1
License Plate	1	Flywire	1
Wheel	1	Chandelier	1
Building and Trades Materials		Hot Water Tank Copper	1
Plastic Piping	50	***Total Sundry Items***	***781***

Table 8 - Oil and Tar

Oil and Tar			
Oil Globules/Tar balls	64	***Total Oil & Tar***	***64***

Table 9 - Remnant Items

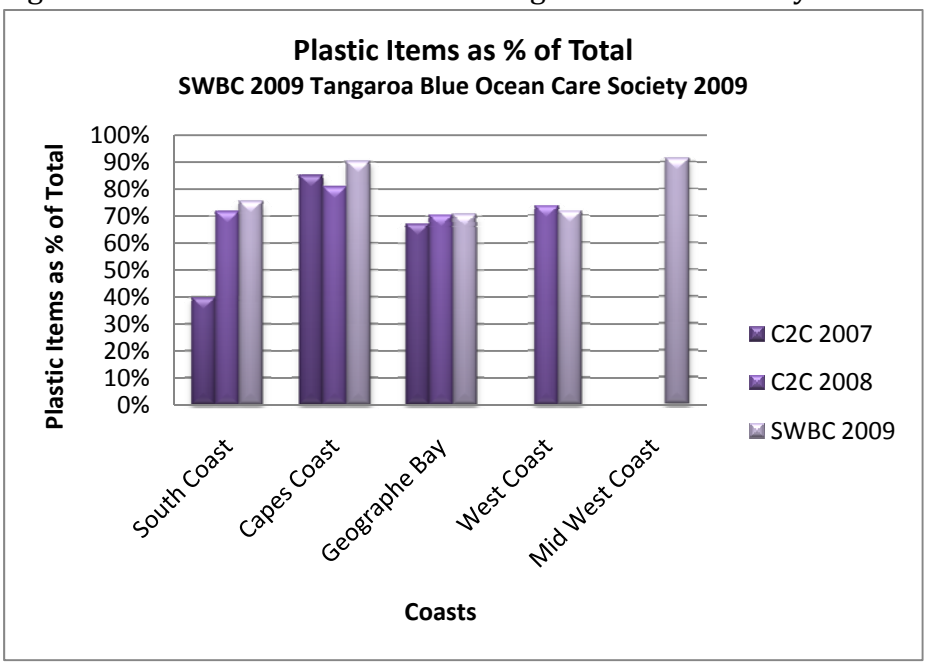
Remnant Items			
Plastic Hard Pieces	10108	Strapping Band Scraps	245
Lids/Bottle Tops/Corks	2611	Foam Fill from Large Buoy	50
Rope Scraps	1443	Plastic Handles	32
Polystyrene Foam	1401	Fishing Net Scraps	12
Glass Broken	1197	Pump Spray Bits	10
Commercial Fishing Remnants	1117	Drum/Container Seals	7
Plastic Film Remnants	603	***Total Remnants***	***18836***
		Total All Categories	***36702.78***

Table 10 - Top 20 Items Ranked by Total

Item	Total	Rank
Project Top 20 Items		
Plastic Hard Pieces	10108	1
Lids/Bottle Tops/Corks	2611	2
Fishing Line - Metres	2589	3
Rope - Metres	1524.2	4
Rope Scraps	1443	5
Polystyrene Foam	1401	6
Cigarettes/Filters	1312	7
Glass Broken	1197	8
Plastic Drink Bottles	1133	9
Glass Drink Bottles	1121	10
Commercial Fishing Remnants	1117	11
Plastic Wrap - Food	983	12
Aluminium Cans	920	13
Plastic Bags	870	14
Paper/Newspaper/Cardboard	703	15
Plastic Wrap - Non Food	646	16
Plastic Film Remnants	603	17
Plastic Containers	423	18
Strapping Bands - Metres	407.58	19
Straws	362	20
20	**31473.78**	

MATERIAL MAKEUP OF ITEMS

Figure 1 – Plastic Items as a Percentage of Total items by Coastal Stretch



The percentage of plastic items has remained consistent. As a rule of thumb the percentage of plastic is lower in areas of higher population and visitation and higher in the more remote areas. Because of their prevalence in the populated sites, items such as aluminium cans, glass drink bottles and clothing which contain little or no plastic reduce the proportion made up by plastic items in the count.

Table 11 - Material Composition of Items by Stretch of Coast

Material Category	West Cape Howe to Cape Leeuwin	Cape Leeuwin to Cape Naturaliste	Cape Naturaliste to Preston River mouth	Preston River mouth to Two Rocks	Two Rocks to Port Gregory	Project Total
Cellulose	0%	0%	0%	0%	0%	0%
Composite	2%	1%	2%	2%	2%	1%
Fabric	1%	1%	2%	1%	1%	1%
Fossil Fuels	0%	0%	0%	0%	0%	0%
Glass and Ceramic	11%	4%	11%	11%	1%	7%
Metal	7%	1%	8%	5%	1%	4%
Organic	0%	0%	0%	2%	0%	0%
Plastic	76%	90%	71%	71%	91%	83%
Pulp	3%	1%	6%	4%	1%	3%
Rubber	0%	1%	0%	1%	1%	0%
Synthetic Rubber	0%	0%	0%	0%	0%	0%
Wax	0%	0%	0%	0%	0%	0%
Wood	1%	1%	1%	1%	1%	1%
	100%	100%	100%	100%	100%	100%

Large and unusual Items Coming Ashore in 2009

During the latter part of winter and early spring, and following a strong onshore season a number of large items washed ashore.

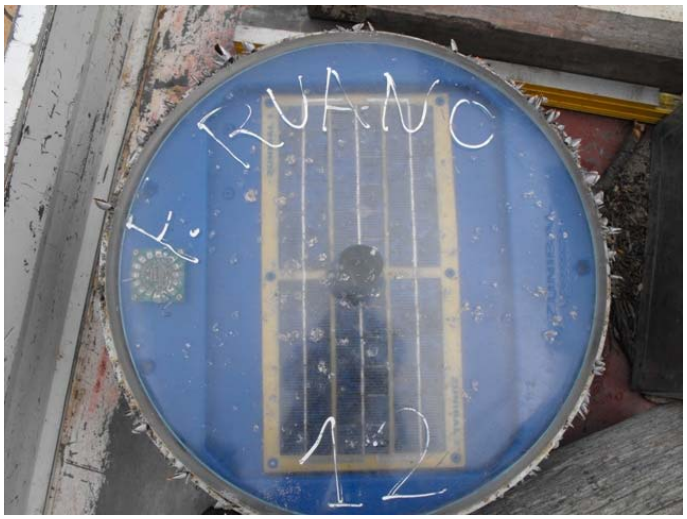
Conto Buoy

A large buoy was found at Conto Spring in late August and was in danger of breaking up on the rocks. Quick action by the Department of Environment and Conservation saw the buoy removed from the water before too much plastic was lost to the environment. The structure of the buoy included tennis ball sized plastic spherical shells encased in a foamed plastic substance. The inner structure was encased in a hard plastic outer layer. The inner fill component of foamed plastic retained a distinctive shape and impression and was easily identified when found later. A number of these were found at Deepdene in October and continue to be found along the coast.

Conto Buoy 30 August 2009

Detail of Internal Structure

Hamelin Bay Tuna Tracker



In early September this tuna tracker was found at Hamelin Bay. Later, in the October cleanup, two fishing crates were found with the names Rogal Pescado and Molienda Del Sur. These items are likely to have moved into the coastal vicinity from well out to sea.

Image courtesy of G. Stokman

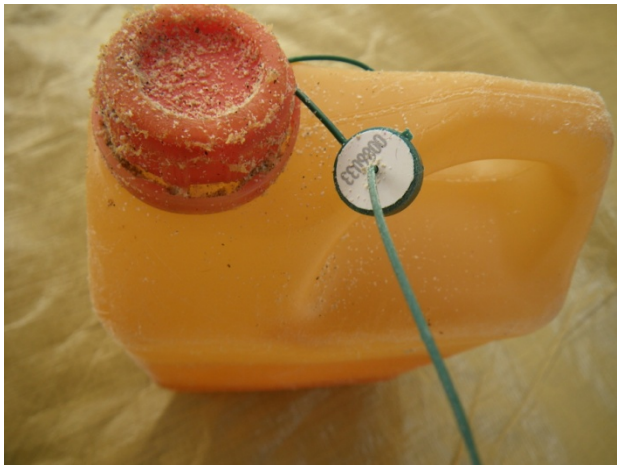
Ellensbrook Rope

Sometime during September a very large knotted mass of tuna line drifted inshore and washed up at Ellensbrook. The rope was estimated to be several kilometres in length. Over the first weekend in October a group of volunteers and DEC rangers worked frantically in rough conditions to remove the rope out of the reach of the waves while waiting for an option for complete removal from the beach. To the regret of the group it was found some of the rope had been placed within an aboriginal sacred site and negotiations then ensued to effect its removal from the site in an appropriate manner.

In the meantime an unknown party decided to burn the rope. As a result of the burning a second cleanup became necessary, this time the task was picking up thousands of burnt rope fragments and plastic rivulets. We urge that plastic material is not burnt on the beach or at sea as the release of toxic smoke will cause further harm.

Burnt Fragments of Rope from Ellensbrook

Containers With Contents Intact Coming Ashore



Sealed Container Unknown Contents

Bleach Bottle with Contents

Oil Bottle (?) with Tag

Pictured here are some of the containers found with contents intact.

The contents of this sealed container found at Deepdene during the cleanup are likely to be toxic given the ID disk which is attached to the tamper seal and lid.

Two unopened bleach bottles were also found at Deepdene along with an unopened oil bottle similar to that pictured below. The content of the oil bottle pictured below which is also sealed is unknown although the substance resembles oil. These small oil (?) bottles turn up periodically on the Capes coast.

Other containers with contents partially or wholly intact and found throughout the year include;

- Containers of vitamin pills
- Tins of lighter fluid
- Tins of kerosene
- Various aerosol cans with contents including insecticides
- Tubs of unknown creams and pastes
- Various personal care and skincare containers.

Other sealed items containing hazardous chemicals and metals include cylume chemical glow sticks and fluorescent tubes.

47 light bulbs and tubes were found this year including 25 from Deepdene and Boranup Beaches. A total of 321 cylume chemical glow sticks were cleared from WA beaches in the cleanup.

The impact of the release of any of these substances in the marine environment can have immediate toxic impacts and a variety of longer term impacts.

LITTER INDEX

This index gives a guide to the proportion of items which come from local littering, dumping and discarding as compared with items which come from runoff, longshore and offshore sources. We hope the index will be used to assist in resource allocation and targeting, especially in prevention activities. The index is based on a number of observed "dispersion" characteristics exhibited by items in the marine environment. Table 12 below shows the dispersion characteristics and how the items are allocated a litter/ local source rating.

Table 12 - Dispersion Characteristics Used in the Litter Local Source Index

	Dispersion Characteristic	Allocation	Typical Items Included
1	Does Not Disperse	100% of these items go into Index A	Broken glass, metal, beer stubbies, whitegoods.
2	Limited Dispersion	100% of these items go into index A	Cigarettes, fishing line, aluminium cans, newspaper
3	Encumbered Drift	Graded % of these go into Index A depending on Population and Coastal Type – Highest proportion is 75%	Plastic wrap, plastic bags
4	Unencumbered Drift	As with 3 with highest proportion being 20%	Pieces of plastic, lids and tops, wood, confection sticks, shotgun shells
5	Very Mobile	Same as 4	Polystyrene foam, plastic drink bottles, straws, cigarette lighters
6	Discarded at Sea	Not included in Index A	Rope, cylume glow sticks, strapping band, fluorescent light tubes

When calculating the litter index, sites are graded into one of the following types:

1 Populated Coast - Sheltered Waters
2 Populated Coast - Open Waters
3 Sparsely Populated Coast - Sheltered Waters
4 Sparsely Populated Coast - Open Waters
5 Island - Populated and or High Tourist Numbers
7 Island - Unpopulated, Low or No Tourist Numbers

When using the index the fraction can be used as a percentage. The index figure expresses the proportion of items which have a high to very high probability of being the result of littering, discarding or other loss at or near to that site. The index will also vary with seasonal changes. In table 13 following, the litter index for each site cleaned in October is ranked from highest to lowest. These ratings should be seen within the context of the October conditions on the WA coast when the amount of offshore debris begins to decline while the amount of litter and local sourced debris begins to increase especially in populated sites.

Table 13 - Litter Index of Sites Ranked Highest to Lowest

Site	Litter and Local Source Index	Non Local Source Index	Rank
Busselton Jetty Underwater Cleanup	0.98	0.02	1
Port Kennedy Bridport Point	0.75	0.25	2
Mandurah Silver Sands	0.73	0.27	3
Busselton Jetty Foreshore	0.71	0.29	4
Woodman Point	0.70	0.30	5
Castle Bay and Rock	0.68	0.32	6
Augusta River mouth to Lookout	0.68	0.32	7
Point Picquet	0.67	0.33	8
Busselton Dolphin Road Boat Ramp	0.66	0.34	9
Dunsborough Town Beach	0.66	0.34	10
Old Dunsborough	0.65	0.35	11
Bunbury Blair St to Hayes St Drain	0.63	0.37	12
Bunbury Back and BP Beach	0.62	0.38	13
Meelup	0.61	0.39	14
Bunker Bay	0.60	0.40	15
Eagle Bay Dog Beach	0.59	0.41	16
Gracetown North Point and Jetty Beach	0.58	0.42	17
Capel Dalyellup Beach	0.58	0.43	18
Bunbury Koombana Bay Turkey Point	0.57	0.43	19
Dawesville Channel to Silver Sands	0.57	0.43	20
Boodjidup to Gas Bay	0.57	0.43	21
Bunbury Back Beach	0.55	0.45	22
Capel Peppermint Grove Beach	0.50	0.50	23
Marmion Marine Park	0.42	0.58	24
Prevelly Gnarabup to Surf Point	0.41	0.59	25
Yeagarup D'Entreacasteux NP	0.38	0.62	26
Gracetown Bay	0.37	0.63	27
Quindalup Boat Ramp	0.36	0.64	28
Gracetown South Point to Lefties	0.32	0.68	29
Kilcarnup	0.29	0.71	30
Smiths Beach	0.27	0.73	31
Cottesloe	0.26	0.74	32
Binningup	0.26	0.74	33
Augusta Lookout to Lighthouse	0.25	0.75	34
Deepdene to Cosy Corner	0.24	0.76	35
Windmills	0.22	0.78	36
Redgate Beach	0.21	0.79	37
Ledge Point	0.18	0.82	38
Hamelin Bay South End	0.18	0.82	39
Yallingup	0.17	0.83	40
Hillview	0.16	0.84	41

Joey's Nose	0.14	0.86	42
3 Bears	0.11	0.89	43
Boodjidup Beach	0.11	0.89	44
Willyabrup	0.10	0.90	45
Sugarloaf Rock	0.10	0.90	46
Quarry Bay	0.09	0.91	47
Ellensbrook Lookout to Creek	0.08	0.92	48
Ellensbrook to Womb	0.07	0.93	49
Foul Bay	0.07	0.93	50
Mitchell Rocks to Wyadup	0.07	0.93	51
Guillotines	0.07	0.93	52
Nornalup Blue Holes Beach	0.06	0.94	53
Skippy Rock Beach	0.06	0.94	54
Injidup - Mitchell Rocks to Car park	0.06	0.94	55
Cosy Corner	0.05	0.95	56
Moses Rock	0.05	0.95	57
Boranup Beach	0.04	0.96	58
Conto Spring	0.03	0.97	59
South Beach	0.03	0.97	60
Gallows	0.02	0.98	61
Quinninup Beach	0.02	0.98	62
Deepdene	0.01	0.99	63
Project	**0.34**	**0.66**	

Figure 2 - Project Signature

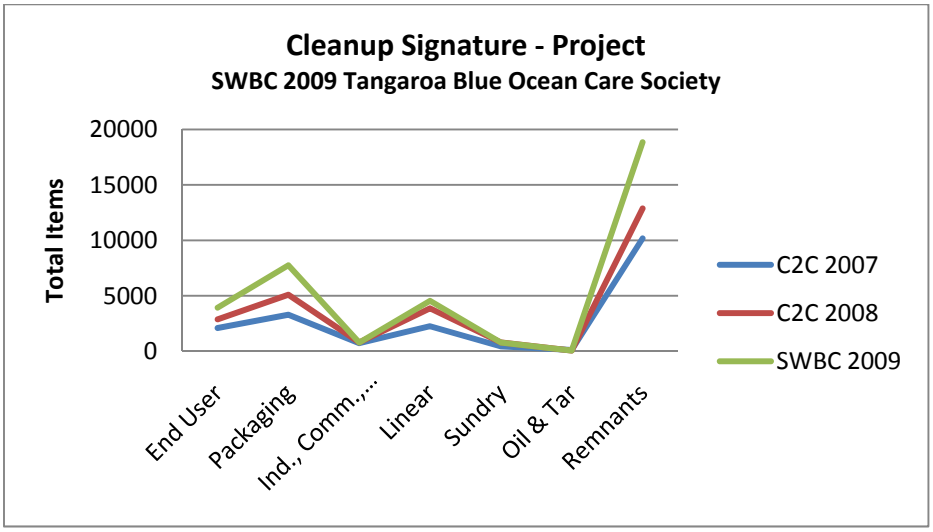


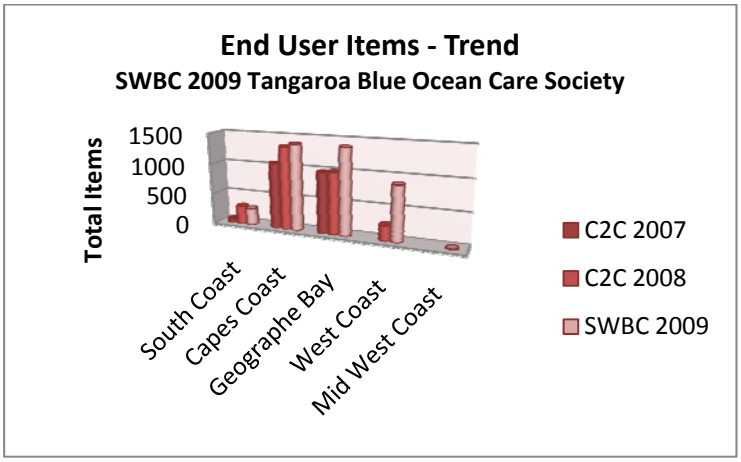
Figure 2 above gives a quick view of the distribution of totals amongst the different debris categories. Packaging items are now showing the largest annual increase. Table 14 below shows the change for all categories between 2007 and 2009.

Table 14 - Change in Marine Debris Category Totals

Change in Category Totals for Years 2007 to 2009						
Category	C2C 2007		C2C 2008		SWBC 2009	
	Total	% Change	Total	% Change	Total	% Change
End User	2091	n/a	2870	9%	3935	12%
Packaging	3288	n/a	5101	11%	7753	16%
Ind., Comm., Fishing & Farm	723	n/a	792	3%	786	0%
Linear	2254	n/a	3871.65	15%	4547.78	6%
Sundry	428	n/a	801	19%	781	-1%
Oil & Tar	119	n/a	60	-24%	64	2%
Remnants	10171	n/a	12867	6%	18836	14%
Total	**19074**	**n/a**	**26362.65**	**9%**	**36702.78**	**13%**

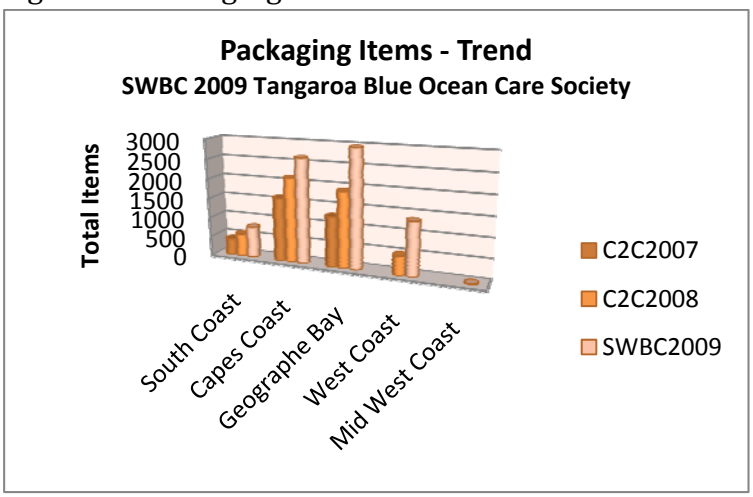
Categories are summarised below with comparisons and trends shown for each coastal stretch for the annual cleanups in 2007, 2008 and 2009.

Figure 3 - End User Items



Geographe Bay and the West Coast show a noticeable increase in end user items. In Geographe Bay the variety of items increased from 28 in 2008 to 39 in 2009 with a steady increase in the numbers of items such as cigarettes butts which increased from 425 in 2008 to 560 in 2009. West Coast sites produced 466 cigarette butts this cleanup.

Figure 4 -Packaging Items



Pictured below is the sorted pile of packaging items collected at isolated Deepdene Beach near Augusta.

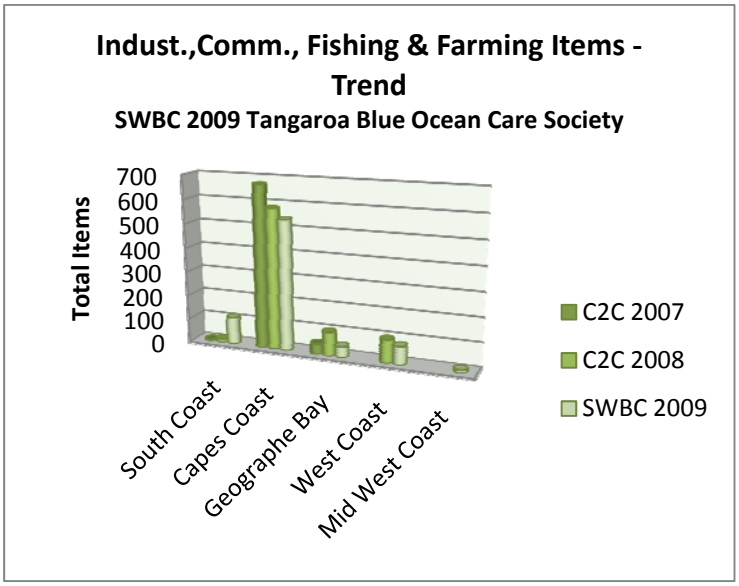
Packaging item numbers increased by 16% from 2008. Four of the five coastal stretches show a sustained and significant increase over the three years. Packaging items totalling in excess of 100 in the project cleanup total are shown in table 15 below along with the change from the previous year. The top

ranking site for each of the first five items listed in this table are Deepdene beach with 87 plastic drink bottles, Yeagarup Dunes D'Entreacasteux National Park with 154 glass drink bottles and 120 aluminium cans, Busselton Jetty Foreshore with 171 plastic food wrappers and Marmion Marine Park with 161 plastic bags. (Note - some of the Yeagarup rubbish was collected from the access track and nearby lake surrounds)

Table 15 - Change in Packaging Item Totals 2007 to 2009

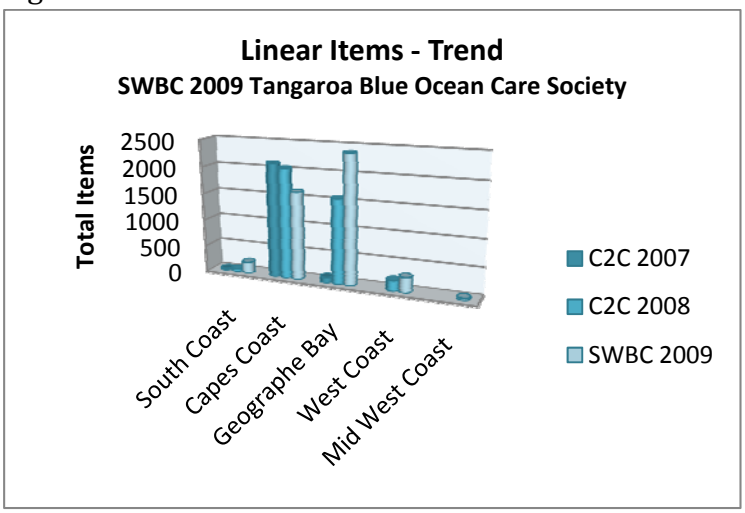
Change in Totals of Selected Packaging Items 2007 to 2009						
	Total	% Change Previous Year	Total	% Change Previous Year	Total	% Change Previous Year
	C2C 2007		C2C 2008		SWBC 2009	
Plastic Drink Bottles	613	n/a	874	10%	1133	10%
Glass Drink Bottles	418	n/a	602	9%	1121	24%
Plastic Wrap - Food	452	n/a	884	19%	983	4%
Aluminium Cans	362	n/a	569	11%	920	19%
Plastic Bags	149	n/a	407	18%	870	32%
Paper/Newspaper/Cardboard	509	n/a	538	2%	703	9%
Plastic Wrap - Non Food	75	n/a	249	18%	646	41%
Plastic Containers	161	n/a	343	20%	423	9%
Bait Bags/Packaging	93	n/a	190	19%	216	5%
Foil	38	n/a	70	12%	162	34%
Bleach/Cleaner Bottles	60	n/a	45	-7%	100	27%

Figure 5 - Industrial, Commercial, Fishing and Farming Items



While the overall percentage change in this category remained at zero, the numbers on the Capes coast show a promising sustained drop. The top ranked group of items came from lobster fishing, 296 items, with the most numerous items being bait container lids numbering 154 of which twenty four were found at Yeagarup. The second ranked group was net and line fishing with 379 items of which 321 were cylume chemical glow sticks and which numbered 97 at Deepdene Beach.

Figure 6 - Linear Items



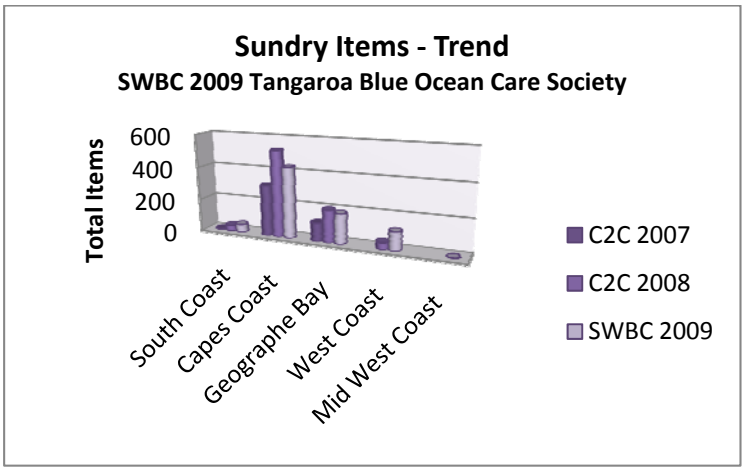
Recovered fishing line totalled 2589 metres during the cleanup with 2170 metres coming from beneath the Busselton Jetty. (See section 5 below) Rope ranked next with 1524 metres. The Ellensbrook tuna line added another 5000 metres to the amount recovered in October. Strapping band followed with 407 metres of which 76.7 were picked up at Boranup Beach. 27 metres of discarded fishing net were also collected.

Table 16 - SWBC 2009 Strapping Band Detail

Strapping Band Colour	Cut	Uncut
Black	3	1
Blue	10	1
Clear	7	3
Cream	1	-
Green	3	1
Pink	4	-
White	6	2
Yellow	3	1
Totals	37	9

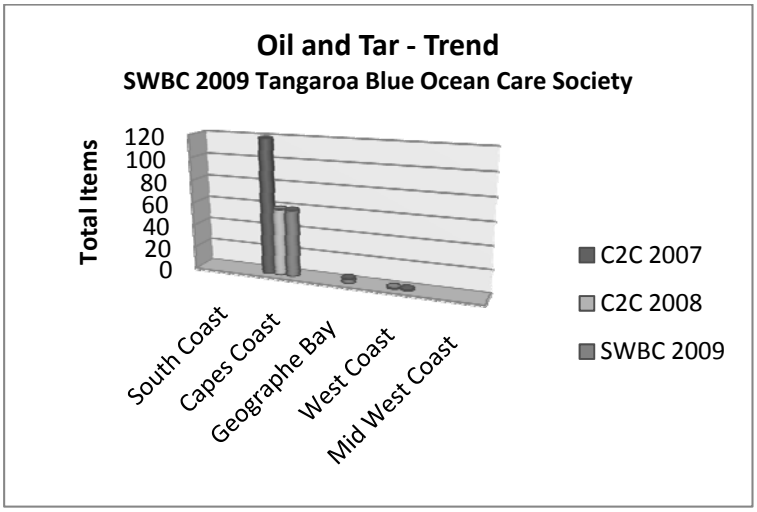
Strapping band has declined in metres found from 1426 metres in 2007, 565 metres in 2008 to 408 metres in 2009. The levels on the Capes are now likely to reflect the annual amount coming ashore as much of the past accumulation has now been cleared. The 24% uncut (intact) bands compares to 12% reported in December 2008. (1)

Figure 7 - Sundry Items



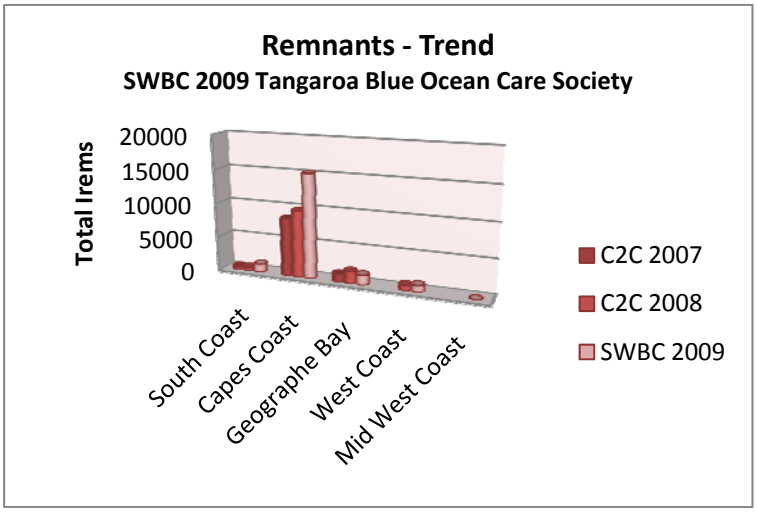
Wood and rubber were frequent among the sundry items which totalled 781 items for 2009. A larger than usual number of lengths of timber was observed along the Capes coast during the cleanup. Many of these had carpet attached as padding. These timbers were not recovered due to the logistics involved.

Figure 8 - Oil and Tar



Oil and Tar has shown a background occurrence of tar balls for two years following several minor oil incidents in 2007. There is a possibility of some oil from the West Atlas oil rig spill travelling down the coast once the Leeuwin Current strengthens during the 2010 winter. The oil and tar distribution suggests the Capes coast in particular but also the west coast may be impacted with sticky oil globules if oil does eventuate.

Figure 9 - Remnant Items



This graph highlights the fragmenting and trapping capacities of the Capes coast with 15162 individual remnant items counted for the Capes coast out of the 18836 remnant total for the project. In a small number of sites some additional remnant item subcategories were used to gauge the presence of particular groups of items such as commercial fishing remnants.

Table 17 - Remnant Items - Capes Coast SWBC 2009

Item	Total
Plastic Hard Pieces	8730
Lids/Bottle Tops/Corks	1855
Rope Scraps	1324
Commercial Fishing Remnants	1000
Polystyrene Foam	888
Plastic Film Remnants	541
Glass Broken	525
Strapping Band Scraps	191
Foam Fill from Large Buoy	50
Plastic Handles	32
Pump Spray Bits	10
Fishing Net Scraps	9
Drum/Container Seals	7

Remnant Items from Boranup Beach North of Hamelin Bay

Table 18 - Commercial Fishing Remnants – Selected Sites

Breakdown of Commercial Fishing Remnants		
	Deepdene	Boranup
Lobster Trap	0	36
Cray-pot Neck	68	40
Bait Box	4	7
Bait Box Lid	0	4
Float Saver	4	2
Foam Float	107	25
Orange Float Pieces	9	4
Crate	59	38
Drum/Bucket	2	1
Cylume	34	5
Fishing Net Accessories	48	11
Total Comm. Fish. Remnants	***335***	***173***
Total Remnants	3454	2026
Percentage - Comm. Fish. Remnants	***10%***	***9%***

Clearly identifiable remnants coming from any commercial fishing activity were counted separately as part of the remnants total of these two long sandy beaches which have transient debris flows. When rope scraps and strapping band scraps are included the Deepdene percentage increases from 9% to 19% and the Boranup figure increases from 41% to 49%. The amount of material in the process of breaking down from these activities is clearly significant on the Capes coast.

4. MONTHLY MONITORING

SOUTH WEST MARINE DEBRIS PROJECT 2007 TO 2009

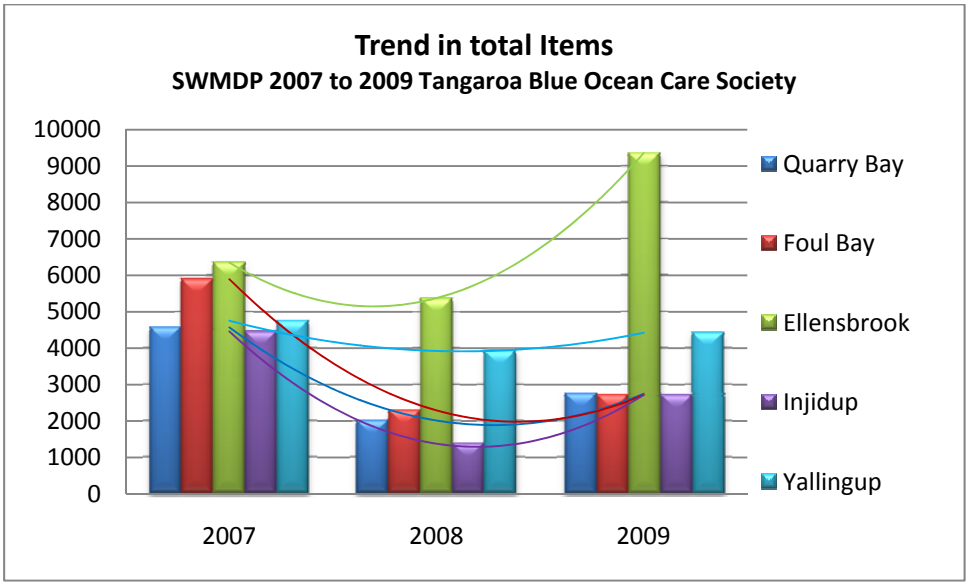
In October 2009 the South West Marine Debris Project concluded its third year of monthly monitoring of 5 sites on the Capes coast. This set of data provides a seasonal and annual guide to changes in marine debris levels and distribution patterns on the Capes coast.

Table 19 - Total Items Collected from Each Site

Site	2007	2008	2009	Total
Quarry Bay	4574	2015	2751.47	9340.47
Foul Bay (Two Sites Combined)	5896	2294	2722	10912
Ellensbrook	6350	5376	9356.5	21082.5
Injidup	4463	1378.85	2717.53	8559.38
Yallingup	4756	3925	4424.8	13105.8
Totals	26039	14988.85	21972.3	63000.15

DATA ANALYSIS – MONTHLY MONITORING SITES

Figure 10 - SWMDP 2007 to 2009 Trend in Total items



The trend in total items across the three years reflects different conditions prevailing in each year. Changes in the pattern and behaviour of weather and ocean currents are key factors.

In 2007 beaches eroded heavily releasing debris buried in the fore dunes. 2008 was a relatively quiet year conditions wise. For 2009 both prolonged periods of onshore winds associated with frontal activity and possibly some ocean current related conditions brought a lot of debris into the coast including the large items mentioned above.

Figure 11 – Project Signature

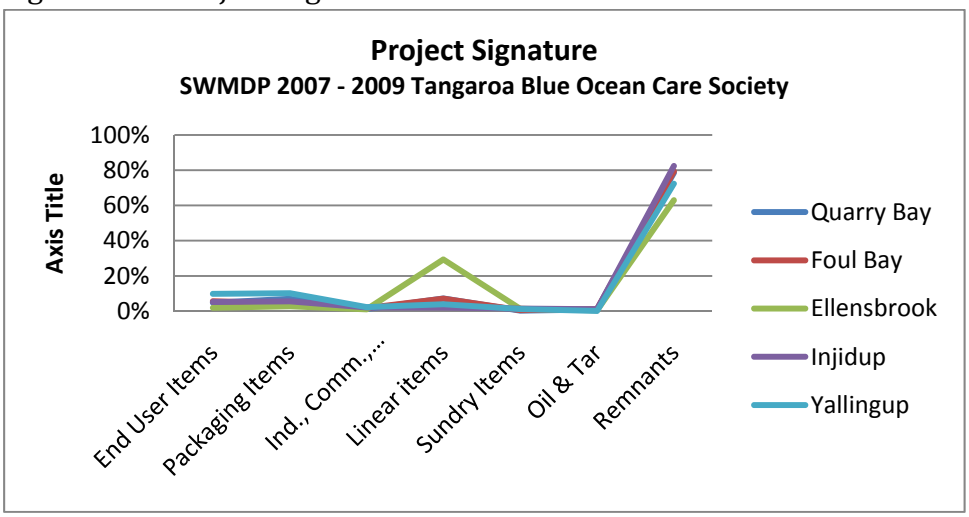
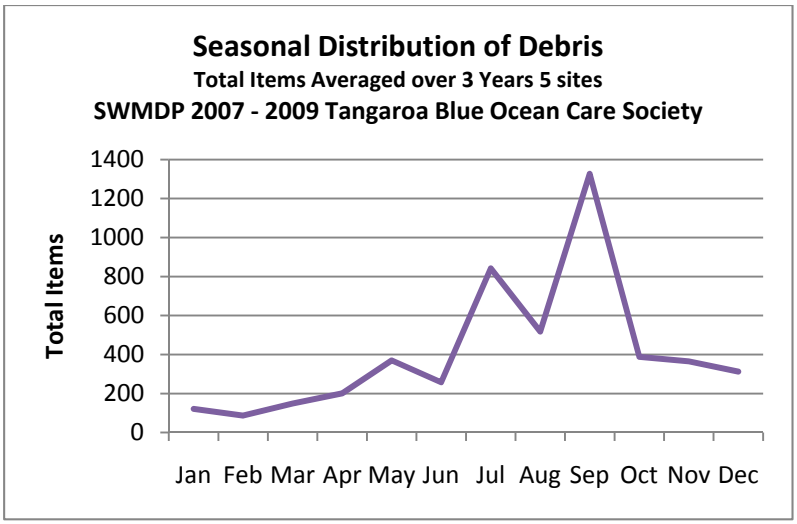
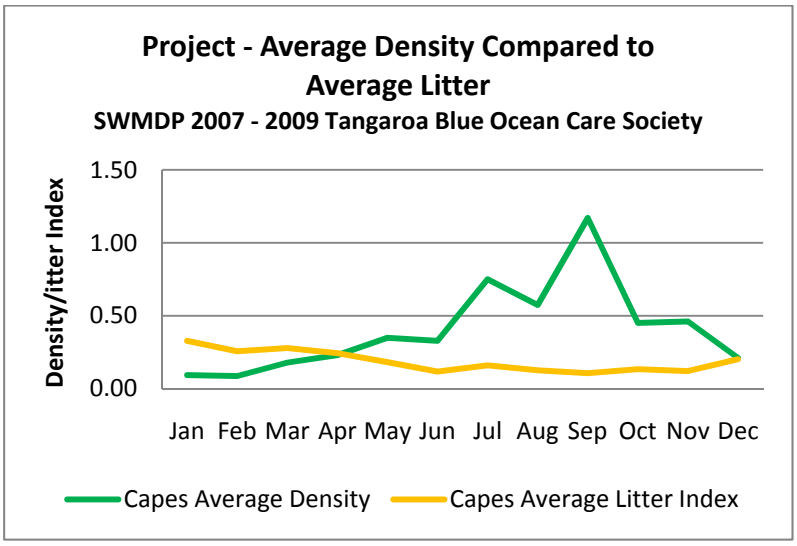


Figure 12 - SWMDP 2007 - 2009 – Seasonal Distribution of Debris



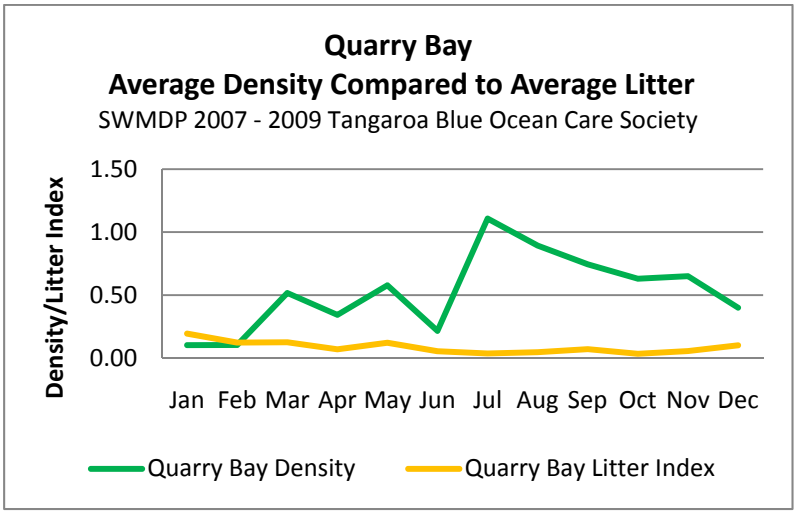
Seasonal distribution of debris on the Capes coast correlates with the timing and strength of the onshore frontal season. Three periods are discernable – January to June when visitor numbers are high and litter is the main source, July to October when offshore debris is prevalent and November December when the last of the winter debris is either cleared or becomes buried.

Figure 13 - Seasonal Average Density Compared with Seasonal Average Litter Index Value



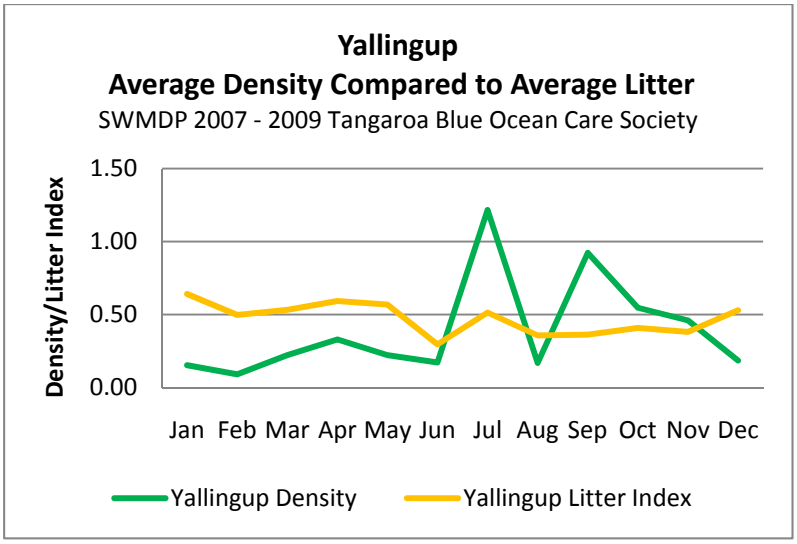
The density of debris on the beach is directly proportional to the total number of items. The green line on the graph therefore indicates the level of debris at the site in a given month. The yellow line is the litter index averaged over three years for each month. This graph shows generally for the Capes coast that littering is high but debris levels are low in the early part of the year and that the opposite prevails through to December.

Figure 14 - Quarry Bay – Density and Litter Index Values



Quarry Bay just north of Cape Leeuwin at the southern end of the Capes coast does not receive many visitors compared to Yallingup which is situated at the northern end. The graph shows Quarry Bay as having minimal littering but experiencing significant non local inputs of debris.

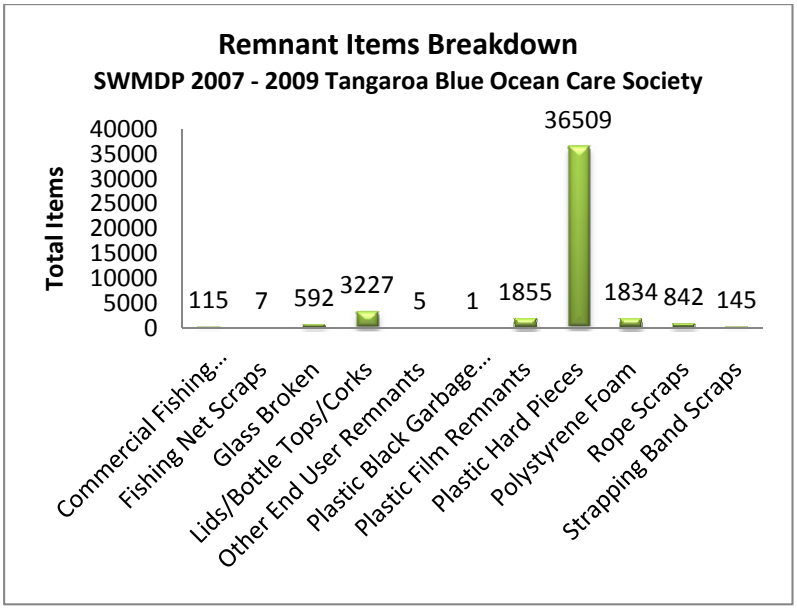
Figure 15 - Yallingup – Density and Litter Index Values



Yallingup receives high numbers of visitors and these numbers quieten down but do not disappear during winter. This graph shows that litter levels remain significant during the year with onshore debris heavily impacting the site in the winter phase.

DISTRIBUTION OF SELECTED ITEMS – MONTHLY MONITORING SITES

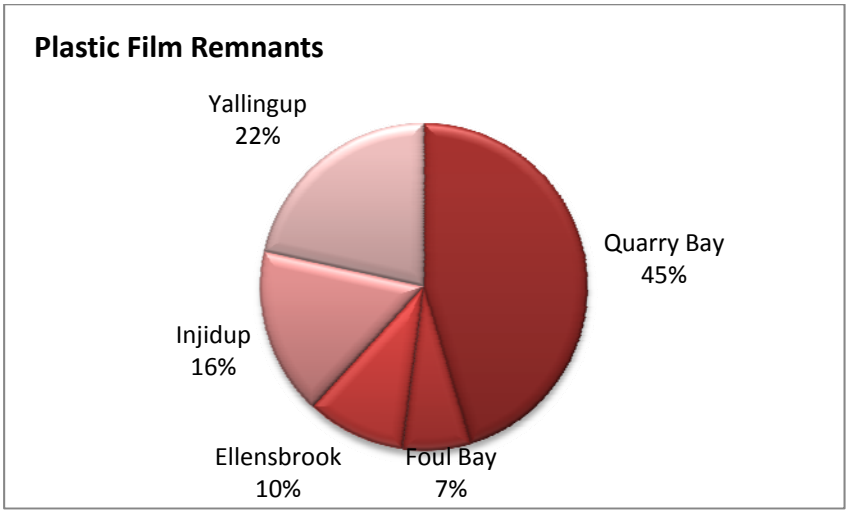
Figure 16 - SWMDP 2007 – 2009 Remnant Items - Breakdown for Monthly Monitoring Sites



Remnants

Worth reiterating here is the capacity of this rocky section of coast to facilitate the fragmenting of plastic items into the millions of plastic shards which now inhabit parts of this environment. These plastic shards present an immediate and dangerous harm potential for many forms of marine life.

Figure 17 - SWMDP 2007 – 2009 Plastic Film Remnants - Breakdown Monthly Monitoring Sites

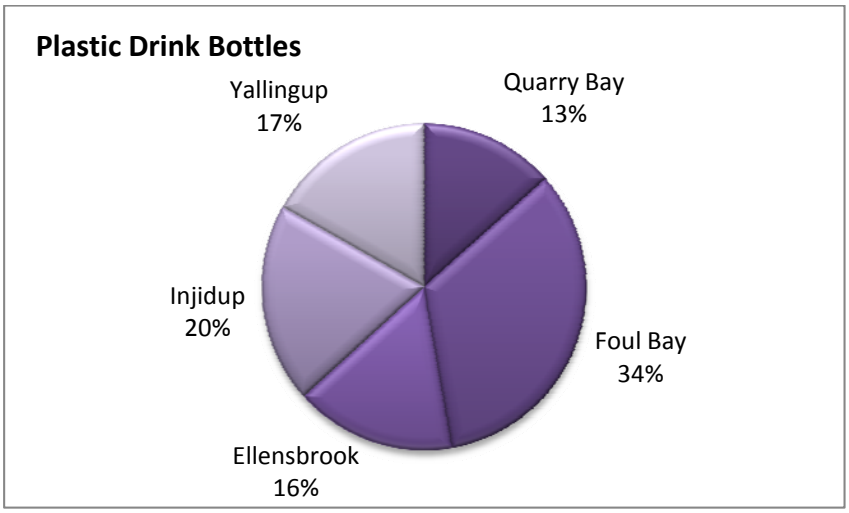


Plastic Film Remnants

Plastic film remnants – bits of plastic bags, sheeting, and food wrap etc – show an interesting distribution pattern. At Quarry Bay they usually wash up entangled in the seaweed wracks. During the cleanup of isolated Deepdene Beach in October, 119 of these remnants were found blowing like confetti along the shoreline.

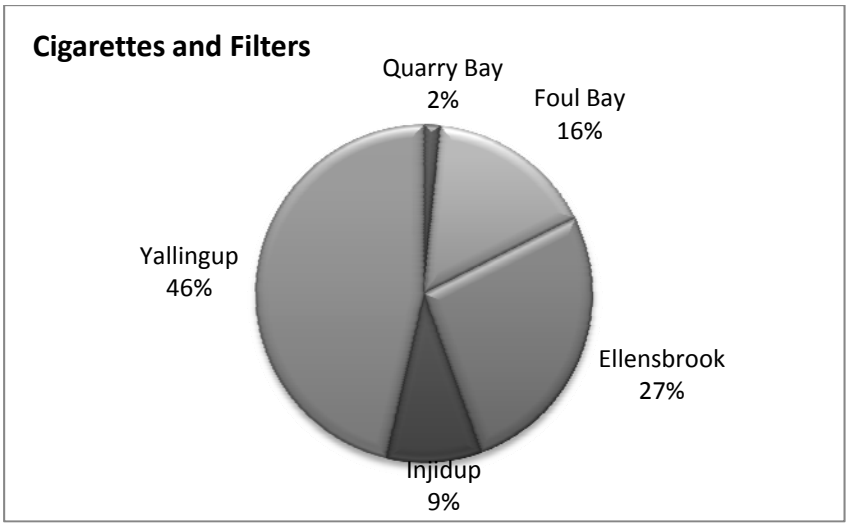
Pictured left is a plastic bag found at Quarry Bay in 2007. Seaweed had anchored itself onto the surface of the bag. Plastic film and plastic bags can sink readily when sand or water combines with the enclosed bag or folds to affect their buoyancy. Plastic film is ingested by various species such as turtles, and seabirds. On the Capes we observe fish oil containers with teeth marks, and suspect that plastic bait bags and black plastic garbage bags containing food scraps (thrown overboard from shipping) are shredded by fish.

Figure 18 - SWMDP 2007 – 2009 – Plastic Drink Bottles



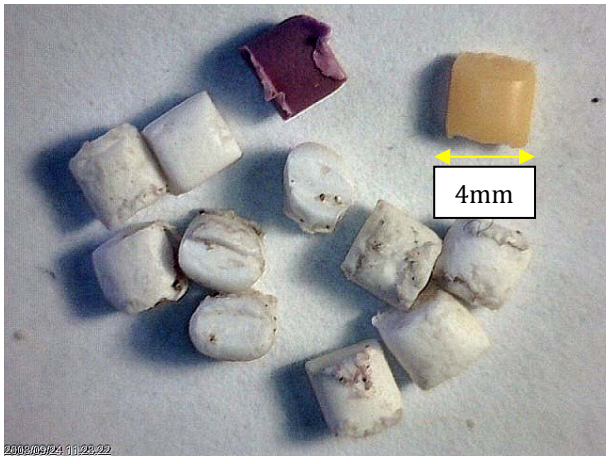
Perhaps the fastest of items to disperse, plastic drink bottles are now ubiquitous in and around Australian coasts. Their distribution on the Capes is likely to be related to the size of the catchment area and its ability to trap the item. A greater proportion of plastic drink bottles at a given site are more likely to come from the general oceanic pool of bottles than from littering or loss at the site itself.

Figure 19 - SWMDP 2007 – 2009 – Cigarettes and Filters



Cigarette butts break down very quickly in water into unrecognisable smaller parts. Butts are only picked up in their recognisable form which means they can be connected directly to the site where they are found. As such they can be directly connected with littering practices. The Ellensbrook figure relates to butts mainly discarded near a lookout platform while the Foul Bay figure results from the habit of one beach user leaving packets of cigarettes in the rock crevices. Yallingup cigarette butts were found mainly on the beach.

Plastic Resin Pellets



Monitoring of plastic resin pellets has showed that these tiny items are one of the most numerous along our coasts. Test results from Japan confirmed they carry low levels of endocrine active substances. Our monitoring also indicates that pellets are coming from the Swan River with Fremantle Harbour being a possible source. Students at Cocos Keeling High school have also sent pellet samples to Japan for testing. Pictured left are some different types of plastic pellets from Port Beach at Fremantle.

5. BUSSELTON JETTY MONITORING PROJECT

BUSSELTON JETTY CLEANUP STATISTICS

Figure 20 -Jetty Cleanup Signature

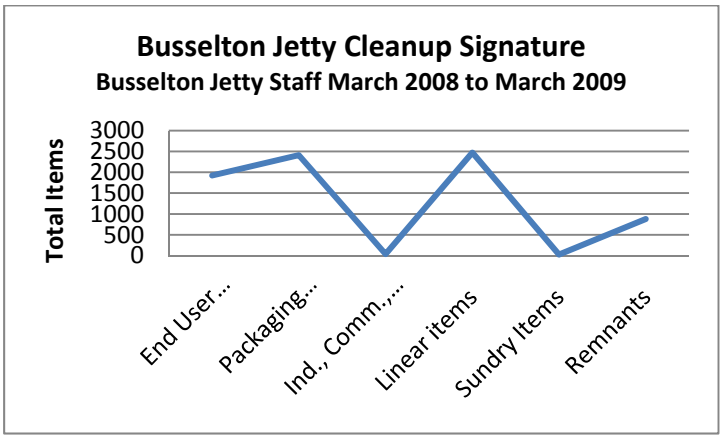


Figure 21 - Jetty Cleanup Totals by Month

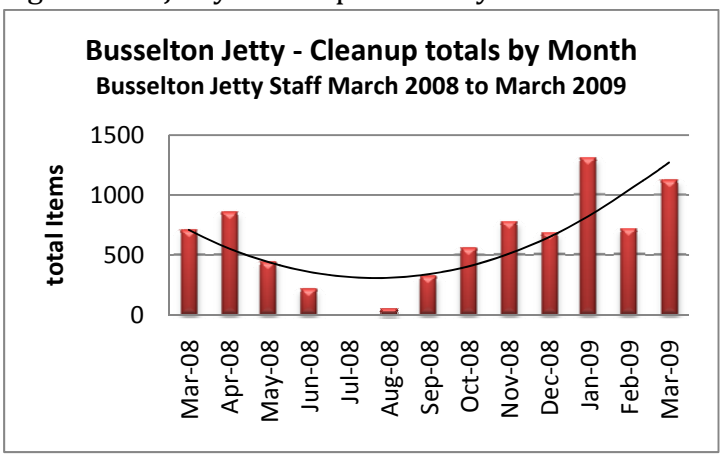
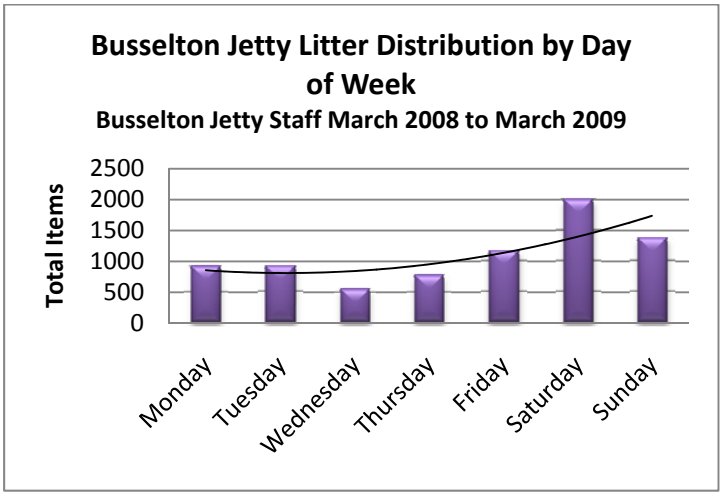


Figure 22 - Jetty Cleanup Totals by Day of Week



Between March 2008 and March 2009 Busselton Jetty staff collected and recorded the amount of rubbish left on the jetty on a daily basis. Cleanup days were reduced in the winter months of July and August.

The cleanup signature gives a quick view of the type of rubbish left on the jetty with cigarette butts being the primary end user item, plastic bags, aluminium cans and glass drink bottles the main packaging items and fishing line caused the linear item spike. See table 20 below for a full list of items and totals.

The annual pattern follows the ebb and flow of the tourist season while Fridays and Saturdays (most likely mainly in the evening) are when littering is most prevalent.

Part of Busselton Jetty was closed for maintenance and repair from March 2009 with the first 200m section remaining open to the public until work begun. This 200m section was the target of the 2009 jetty underwater cleanup. 2170 metres of fishing line was retrieved from beneath the jetty from the 200m section compared to the 2008 total of 1170 metres for the whole jetty. 2450 metres of additional fishing line were picked up from the top of the jetty by staff during their 12 month cleanup.

ITEMS RECOVERED FROM BUSSELTON JETTY

Table 20 - List of Items collected from Busselton Jetty

List of items From Busselton Jetty Ranked by Total			
Fishing Line - Metres	2450	Cigarette Lighters	7
Cigarettes/Filters	1176	Electrical Cable and Equipment	6
Plastic Bags	522	Bubble Wrap	6
Aluminium Cans	421	Pull Tabs	6
Bait Bags/Packaging	402	Matches	5
Lids/Bottle Tops/Corks	392	Strapping Bands - Metres	5
Glass Drink Bottles	326	Shoes	5
Plastic Hard Pieces	265	Tea Bag	5
Plastic Wrap - Food	235	Confection Sticks	4
Plastic Drink Bottles	230	Metal	4
Balloons	150	Band Aid	4
Hooks/Sinkers	143	Foil	3
Plastic Film Remnants	135	Fishing Rod/Hand Reel	3
Paper/Newspaper/Cardboard	134	Crates/Buckets	2
Tissues	98	Plastic Bags Dog Poo	2
Cloth/Clothing	81	Furniture	2
Glass Broken	76	Glass Jars	2
Cups/Plates/Cutlery	59	Nappies	2
Plastic Containers	51	Tins	2
Binding/Thread/String	45	Torch	1
Wooden Ice Cream Sticks	39	Toilet Paper	1
Fishing Lures	37	Skincare Bottles/Tubes	1
Tobacco Packaging	33	Batteries	1
Plastic Wrap - Non Food	33	Poly-weave Bag	1
Straws	25	Hessian Bag	1
Bait Containers/Lids	22	Building Materials	1
Rope - Metres	15	Dummy	1
Fishing Floats	14	Oil/Lube Bottles	1
Cable Ties/Tags	12	Cars/Car Parts	1
Dog Faeces	12	Mobile Phone	1
Rubber	11	Condoms/Wrappers	1
Polystyrene Foam	8	Drug Paraphernalia	1
		64	**7740**

NOTES

(1) An Approach to Monitoring Beached Plastic Strapping Band, W. Smith, Tangaroa Blue Ocean Care Society December 2008

6. VOLUNTEERS AND SUPPORTERS

We would like to make a special thanks to the following people for their ongoing support to Tangaroa Blue's South West Marine Debris Project. With their dedication, hundreds of thousands of pieces of debris have been removed from South West beaches, helping to protect our precious marine life. You are making a difference!!

Renee Mouritz Liz McGuire Alison Dorn Anita Kelly Dawn Green

To the following groups, thank you for participating in the South West Beach Clean Up and helping us protect our oceans, we look forward to your support again in 2010!

Augusta Regional Environment Centre

Probus Club of Dunsborough

Dunsborough CALC

Dunsborough District Progress Association

The Underwater Explorer's Club

Busselton Underwater Observatory & Jetty Staff

Gracetown Progress Association

Margaret River Surfrider Foundation Branch

Prevelly Penguins

Cape to Cape Catchments Group

Dunsborough Bay Yacht Club

Keep Busselton Beautiful Group

Friends of Marmion Marine Park

ACTIV Foundation

Leeuwin Links

Karridale Primary School

Margaret River High School

Australian Seabird Rescue – Mandurah

Bouvard Coastcare Group

Geocatch

Project Shorelines Bunbury

Coastswap

Walpole Nornalup National Parks Association

West Australian Fishing Industry Council

Alcoa

Falcon Coastcare Group

Raytheon Australia

Yeagarup Trust

OceanWatch Australia

To all the individual volunteers, we appreciate your time and efforts in helping us clean up our coastline during the South West Beach Clean Up we hope to have you back again in 2010!!

And thank you for the support from the following organisations and agencies that supported this project through funding, insurance, materials, time, effort and lots of encouragement.
We look forward to working with you again in 2010!

Coastwest

South West Catchments Council

Department of Environment & Conservation

Department of Fisheries

Shire of Busselton

The Dive Shed

Shire of Augusta Margaret River

Shire of Capel

City of Mandurah

City of Bunbury

Town of Cottesloe

Keep Australia Beautiful Council, WA

Project Aware

Ansell

A DATE FOR YOUR DIARIES!!!

SOUTH WEST BEACH CLEAN UP –GERALDTON TO ALBANY

9th & 10th OCTOBER 2010

ATTACHMENTS

ATTACHMENT 1 – CLEANUP SITE LOCATION DETAILS

Cleanup Sites – Geographical Details			
Site Code	Site	Latitude	Longitude
South Coast			
West Cape Howe to Point D'Entreacasteux (Walpole – Nornalup)			
60301040	Nornalup Blue Holes Beach	35° 0'58.58"S	116°46'52.07"E
Point D'Entreacasteux to Black Point (Pemberton)			
60302030	Yeagarup, D'Entreacasteux NP	34°35'33.85"S	115°48'25.88"E
Black Point to Cape Leeuwin (Augusta)			
60303045	Augusta River mouth to Lookout	34°20'49.79"S	115°10'6.63"E
60303155	Augusta Lookout to Lighthouse	34°22'3.98"S	115° 8'53.74"E
Capes Coast			
Cape Leeuwin to White Cliff Point (Augusta)			
60401010	Quarry Bay	34°21'53.42"S	115° 8'14.63"E
60401020	Skippy Rock Beach	115° 8'5.50"E	115° 7'29.27"E
60401030	Hillview	34°19'11.61"S	115° 5'28.12"E
60401040	Deepdene	34°17'2.14"S	115° 3'30.40"E
60401045	Deepdene to Cosy Corner	34°15'58.10"S	115° 2'4.18"E
60401050	Cosy Corner	34°15'28.08"S	115° 1'50.81"E
60401060	Foul Bay	34°14'57.01"S	115° 1'47.12"E
White Cliff Point to Cape Freycinet (Hamelin Bay, Karridale)			
60402001	Hamelin Bay South End	34°13'3.52"S	115° 1'58.59"E
60402010	Boranup Beach	34°11'2.79"S	115° 2'6.55"E
60402025	South Beach	34° 6'31.76"S	114°59'58.10"E
Cape Freycinet to Cape Mentelle (Witchcliffe, Prevelly, Margaret River)			
60403030	Conto Spring	34° 4'37.27"S	115° 0'7.50"E
60403035	Redgate Beach	34° 2'34.40"S	115° 0'4.58"E
60403050	Boodjidup Beach	34° 0'50.09"S	115° 0'3.58"E
60403051	Boodjidup to Gas Bay	34° 0'50.09"S	115° 0'3.58"E
60403065	Prevelly Gnarabup to Surf Point	33°58'52.95"S	114°59'24.10"E
Cape Mentelle to South Point (Margaret River, Gracetown)			
60404020	Kilcarnup	33°57'33.01"S	114°59'8.64"E
60404021	Joey's Nose	33°56'56.38"S	114°59'34.89"E
60404050	Ellensbrook Lookout to Creek	33°54'26.49"S	114°59'17.88"E
60404110	Gracetown South Point to Lefties	33°52'13.51"S	114°58'41.05"E
60404183	Ellensbrook to Womb	33°53'21.72"S	114°59'4.52"E
South Point to Cape Clairault (Gracetown, Cowaramup)			
60405010	Gracetown Bay	33°51'45.74"S	114°59'17.42"E
60405040	Gracetown North Point and Jetty Beach	33°51'29.69"S	114°59'3.29"E
60405050	Guillotines	33°49'38.49"S	114°59'43.55"E
60405060	Gallows	33°49'11.78"S	114°59'52.72"E
60405070	Willyabrup	33°47'28.28"S	114°59'59.34"E
60405080	Moses Rock	33°45'36.61"S	114°59'23.14"E
60405090	Quinninup Beach	33°44'43.24"S	114°59'25.11"E

Cape Clairault to Cape Naturaliste (Yallingup, Dunsborough)			
60406010	3 Bears	33°34'55.26"S	115° 0'49.89"E
60406023	Injidup - Mitchell Rocks to Car park	33°41'55.33"S	114°59'17.24"E
60406023	Mitchell Rocks to Wyadup	33°40'56.58"S	114°59'33.70"E
60406070	Smiths Beach	33°39'29.95"S	33°39'29.95"S
60406080	Yallingup	33°38'11.86"S	115° 1'39.18"E
60406100	Sugarloaf Rock	33°33'37.99"S	115° 0'21.91"E
60406120	Windmills	33°32'29.43"S	115° 0'30.55"E
Geographe Bay			
Cape Naturaliste to Siesta Park (Dunsborough)			
60501010	Bunker Bay	33°32'41.11"S	115° 2'18.05"E
60501020	Eagle Bay Dog Beach	33°33'5.87"S	115° 3'40.37"E
60501041	Point Picquet	33°33'55.19"S	115° 5'3.79"E
60501060	Meelup	33°34'25.30"S	115° 5'15.19"E
60501091	Castle Bay and Rock	33°34'54.32"S	115° 5'46.54"E
60501100	Old Dunsborough	33°35'54.03"S	115° 6'14.43"E
60501130	Dunsborough Town Beach	33°36'51.62"S	115° 6'42.98"E
60501170	Quindalup Boat Ramp	33°37'52.71"S	115° 8'53.54"E
Siesta Park to Vasse River mouth (Busselton)			
60502011	Busselton Dolphin Road Boat Ramp	33°39'16.95"S	115°18'7.11"E
60502040	Busselton Jetty Foreshore	33°38'40.32"S	115°20'37.28"E
60502080	Busselton Jetty Underwater Cleanup	33°37'59.57"S	115°20'19.88"E
Vasse River mouth to Gelorup (Capel)			
60503020	Capel Peppermint Grove Beach	33°31'20.71"S	115°30'31.02"E
60503040	Capel Dalyellup Beach	33°24'13.78"S	115°36'6.20"E
Gelorup to Preston River mouth (Bunbury)			
60504010	Bunbury Back and BP Beach	33°19'55.95"S	115°37'38.97"E
60504011	Bunbury Back Beach	33°19'55.95"S	115°37'38.97"E
60504020	Bunbury Blair St to Hayes St Drain	33°19'32.74"S	115°38'43.03"E
60504040	Bunbury Koombana Bay Turkey Point	33°19'12.27"S	115°38'48.65"E
West Coast			
Preston River mouth to Bouvard (Binningup, Harvey, Myalup, Waroona, Preston Beach)			
60601010	Binningup	33° 9'0.59"S	115°41'7.23"E
Bouvard to Point Peron (Mandurah, Rockingham, Port Kennedy)			
60602020	Dawsville Channel to Silver Sands	32°33'8.87"S	115°40'40.76"E
60602050	Mandurah Silver Sands	32°30'40.31"S	115°43'53.42"E
60602060	Port Kennedy Bridport Point	32°22'9.82"S	115°43'6.28"E
Point Peron to Swan River mouth (Perth Metro – Cockburn Sound)			
60603030	Woodman Point	32° 8'6.97"S	115°45'3.09"E
Swan River mouth to Two Rocks Sand Dunes (Perth Metro – West Coast Beaches)			
60604010	Cottesloe	31°59'39.47"S	115°45'3.70"E
60604020	Marmion Marine Park	31°52'19.66"S	115°45'4.36"E
Mid West Coast			
Two Rocks Sand Dunes to Sandy Point Jurien Bay (Ledge Pt, Cervantes, Jurien Bay, Badgingarra)			
60701030	Ledge Point	31° 6'39.35"S	115°22'13.68"E
Total Number of Sites = 63			